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**REMARKS**

The current patent application has been reviewed in light of the non-final Office Action, dated November 7, 2006, (hereinafter "the office action"). In the office action, the specification is objected to for various informalities. Claims 1, 6, 11, and 14 are objected to for various informalities. Claims 1-10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Pat. No. 6,741,809. Claims 1-5 and 8-9 are rejected under 35 U.S.C. §102(b) as being anticipated by Correa et al. (U.S. Pat. No. 6,340,114). Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Correa et al. (U.S. Pat. No. 6,340,114) in view of Niikawa (U.S. Pat. No. 6,668,134). Claims 11-15 are allowed. Entry and consideration of the above amendments and the following remarks is respectfully requested.

Claims 16-23 have been added. Support for the new claims is found throughout the specification. No new matter is added.

Claims 1-7, 9, and 11-15 have been amended. Assignee has amended claims to more clearly delineate intended subject matter. The amendments to the claims are made without prejudice or disclaimer.

***Allowable Subject Matter***

*Claims 11-15 are allowed.*

Assignee thanks the Examiner for allowing the claims. Claims 11-15 have been amended to correct the informalities noted by the Examiner and place the claims in better form.

***Objections to the Specification***

A new substitute specification is enclosed herewith and a marked up specification is provided showing the changes made.

***Claim Objections***

Claims 1, 6, 11, and 14 have been amended to correct the informalities.

***Double Patenting Rejection***

*Claims 1-10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Pat. No. 6,741,809.*

Without conceding the propriety of the rejection and solely to expedite allowance of the application, a terminal disclaimer is filed herewith to obviate the double patenting rejections.

***Claim Rejections – 35 U.S.C. § 102***

*Claims 1-5 and 8-9 are rejected under 35 U.S.C. §102(b) as being anticipated by Correa et al. (U.S. Pat. No. 6,340,114).*

Assignee traverses the rejections.

Claim 1 has been amended to incorporate the recitations of claims 5-6 and clarify that the claimed image capturing apparatus comprises “a second lens set disposed on a sliding set, the sliding set capable of sliding within the housing and positioning the second lens set between the two viewfinder ports” of an optical viewfinder.

Correa teaches an apparatus for an optical code reader that includes an image sensor, a lens assembly for focusing light, and means for controlling the lens assembly to select a field of view. See FIG. 10, col. 12, lines 1-47. Contrary to the claimed apparatus, Correa does not teach “a second lens set at the housing, the second lens set capable of moving relative to the housing and being aligned with the optical viewfinder.”

Thus, Correa does not teach every element contained and arranged as recited in the claim, and the rejection is improper. Withdrawal of the rejection is respectfully requested.

Claims 2-5 and 8-9, dependent on amended claim 1, are also allowable because they depend from an allowable claim and recite further distinguishing limitations. Withdrawal of the rejections is requested.

***Claim Rejections – 35 U.S.C. § 103***

*Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Correa et al. (U.S. Pat. No. 6,340,114) in view of Niikawa (U.S. Pat. No. 6,668,134).*

Assignee traverses the rejections. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations.

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Assignee submits that the Examiner failed to properly establish a *prima facie* case of obviousness because all of the claimed limitations are not taught or suggested by the cited references. As discussed above, Correa fails to disclose all of the elements of claim 1. Thus, Correa, alone or in combination with Niikawa, continues to fail to disclose all of the elements of claim 10, which is dependent upon claim 1.

It is noted that claimed subject matter may be patentably distinguished from the cited documents for additional reasons; however, the foregoing is believed to be sufficient. Likewise, it is noted that the Assignee's failure to comment directly upon any of the positions asserted by the Examiner in the office action does not indicate agreement or acquiescence with those asserted positions.

#### CONCLUSION

In view of the foregoing, it is respectfully asserted that all of the claims pending in the present patent application are in condition for allowance. If the Examiner has any questions, she is invited to contact the undersigned at (503) 439-6500. Entry of this amendment and reconsideration of the present patent application in view of the same, and early allowance of all the claims is respectfully requested. Please charge any underpayments or credit any overpayments to deposit account no. 50-3703.

Respectfully submitted,

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## MARKED UP SPECIFICATION

~~Electronic Version~~~~Stylesheet Version v.1.1.1~~

## Description

# IMAGE CAPTURING APPARATUS WITH A LASER-FRAMING VIEWFINDER

## BACKGROUND OF INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to an image capturing apparatus, and more specifically, to an image capturing apparatus with a laser-framing viewfinder.

[0003] 2. Description of the Prior Art

[0004] Digital cameras have become popular digital products and are positioned to eventually replace conventional film cameras due to low prices and compatibility with other electronic peripherals. Please refer to FIG. 1. FIG. 1 is a front view diagram illustrating a conventional first digital camera 10. The first digital camera 10 includes a camera lens 12 for capturing an object, an optical viewfinder 14 composed of several lenses for users to view the image of an object refracted by the lenses, and a shutter button 16 for

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focusing and shooting. Please refer to FIG. 2. FIG. 2 is a rear view diagram of the first digital camera 10. The first digital camera 10 further includes an electrical viewfinder 18 providing users another option to view the image of the object, which can be a liquid crystal display (LCD) or a low temperature polysilicon (LTPS) display. A control button set 20 is for users to browse and edit images or to set up parameters. The first digital camera 10 differs from conventional film cameras by providing the electrical viewfinder 18. Users can view the image of the object on the electrical viewfinder 18 instead of the smaller optical viewfinder 14. In addition, the users ~~can use~~ can use the electrical viewfinder 18 to browse the images after shooting.

[0005] However, the image displayed on the electrical viewfinder 18 is limited by resolution and size and because it ~~[[isa]]~~ is a result of an image signal captured by an image sensor and then processed by a digital signal processor ~~(DSP), distortion~~ (DSP), distortion when compared to the actual image is observed. Users may ~~discover blurry~~ discover blurry images due to nonfocusing or hand trembling ~~that is~~ that is not apparent when shooting them. Moreover, the electrical

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viewfinder 18 has high power consumption and has a limited angle of view.

[0006] Alternatively, users can view the object through the optical viewfinder 14. In this situation users are required to hold the camera close to their face, which is not only inconvenient but also slows down shooting. Additionally, the LCD or LTPS ~~used in~~ used in the electrical viewfinder 18 costs a significant amount and is not profitable on low-level digital cameras or small-size digital image capturing apparatuses. Thus, there is a need to design a lower cost viewfinder for small-size low-cost digital image capturing apparatuses.

## SUMMARY OF INVENTION

[0007] It is therefore a primary objective of the present invention to provide an image capturing apparatus with a laser-framing viewfinder to solve the problems mentioned above.

[0008] Briefly summarized, an image capturing apparatus with a laser-framing viewfinder includes a housing, a laser source installed inside the housing for generating a laser beam, a first lens installed inside the housing for diverging the laser beam, a framing mask for masking the laser beam diverged by the



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first lens to form a laser-framing viewfinder, and a camera lens installed in the housing for capturing an object in the laser-framing viewfinder.

[0009] These and other objectives of the present invention will no doubt become obvious to those of ordinary skill in the art after reading the following detailed description of the preferred embodiment that is illustrated in the various figures and drawings.

## BRIEF DESCRIPTION OF DRAWINGS

[0010] FIG. 1 is a front view diagram illustrating a conventional first digital camera.

[0011] FIG. 2 is a rear view diagram of the first conventional digital camera.

[0012] FIG. 3 is a front view diagram of a ~~second~~ digital camera according to the present invention.

[0013] FIG. 4 is a rear view diagram of a ~~second~~ digital camera according to the present invention.

[0014] FIG. 5 is a cross section diagram of the ~~second~~ digital camera along line ~~[[5-5'']]~~ 5-5' in FIG. 4.

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- [0015] FIG. 6 is a diagram illustrating a framing mask.
- [0016] FIG. 7 is a diagram illustrating the laser-framing viewfinder.
- [0017] FIG. 8 is a diagram illustrating the sliding set sliding to the upper side.
- [0018] FIG. 9 is a diagram illustrating the ~~second~~ digital camera capturing an image through the laser-framing viewfinder.

## DETAILED DESCRIPTION

- [0019] Please refer to FIG. 3 and FIG. 4. FIG. 3 is a front view diagram and FIG. 4 is a rear view diagram of a ~~second~~ digital camera 22 according to the present invention. The ~~second~~ digital camera 22 includes a housing 24, a camera lens 26 for capturing images, a rotating plate 28 installed on the housing 24 for protecting the camera lens 26 from dust and dirt, ~~[[two]]~~ an optical viewfinders viewfinder 30 having two viewfinder ports which are installed respectively on the front side and the rear side of the housing 24 for users to view the image of an object. The ~~second~~ digital camera 22 further includes a shutter button 32 for focusing and shooting, a control button set 33 for controlling functions of the ~~second~~ digital camera 22, and a connecting port 34 for outputting the photo image



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data, which conforms to the USB1.1, USB2.0, USB OTG or the IEEE1394 standard.

[0020] Please refer to FIG. 5. FIG. 5 is a cross section diagram of the ~~second~~ digital camera 22 along line ~~[[5-5'']]~~ 5-5' in FIG. 4. The housing 24 includes a main body 36 and a sliding set 38 installed on the main body 36. The ~~second~~ digital camera 22 further includes a laser source 40 installed inside the main body 36 for generating a laser beam, a reflector 42 such as a plane mirror that is adjustable and installed in the sliding set 38 for reflecting the laser beam generated by the laser source 40, a first lens 44 installed inside the sliding set 38 for diverging the laser beam reflected by the reflector 42, and a third lens 45 positioned above the laser beam 40 for adjusting the laser beam generated by the laser source 40.

[0021] The ~~second~~ digital camera 22 further includes a framing mask 46 installed inside the sliding set 38, which includes shading material for masking the laser beam diverged by the first lens 44 and reflected by the reflector 42 to form a laser-framing viewfinder. Please refer to FIG. 6. FIG. 6 is a diagram illustrating the framing mask 46. The lined area is the ~~shadingmaterial~~ shading material and the laser beam can only

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pass through the clear area of the framing mask 46 to form a shape of a laser-framing viewfinder. Please refer to FIG. 7. FIG. 7 is a diagram illustrating the laser-framing viewfinder formed after the laser beam passes through the framing mask 46. Users can capture an image inside the box marked by the laser-framing viewfinder and the dotted cross in the center is for aiming the center. Designers can determine the shape of the laser-framing viewfinder by modifying the shape of the framing mask 46. ~~The 46.~~ The visual angle of the laser framing viewfinder can be configured to be the same to the visual angle of the camera lens ~~[[26by]]~~ 26 by adjusting the combination or the focus of the first lens 44, the third lens 45 and the framing mask 46, in order to have the image in the laser-framing viewfinder be the same to the real image. The second digital camera 22 further includes a second lens set 48 installed inside the sliding set 38, which can slide with the sliding set 38 to the position between the two viewfinder ports of the optical viewfinders viewfinder 30. The second lens set 48 includes a plano-concave lens and a convexo-concave lens, or can be other combinations of lenses. Please refer to FIG. 8. FIG. 8 is a diagram illustrating the sliding set 38 when

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slid to the upper side. When the sliding set 38 slides ~~upwards~~in upwards in the housing 24, the second lens set 48 slides to a position between the two viewfinder ports of the optical viewfinders ~~30~~. The viewfinder 30. The user can view the object through the optical viewfinder 30, and the visual angle of the optical viewfinder 30 can be configured to be the same to the visual angle of the camera lens 26 by adjusting the focus and the combination of the second lens set 48, in order to have the image shown in the optical viewfinder 26 be the same to the real image captured by the camera lens 26.

[0022] The operation of the ~~second~~ digital camera 22 is as following follows. When viewing an image, the user can switch on the laser source 40 using the control button set 33 so that the laser source 40 generates a laser beam. The beam. The laser beam passes through and is focused by the third lens 45 and is then reflected toward the first lens 44 by the reflector 42. The angle between the reflector 42 and the laser source 40 can be adjusted according to a required angle of reflection. The laser beam is further diverged by the first lens 44 and directed toward the framing mask 46. The framing mask 46 partially blocks the laser beam to form a laser-framing

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viewfinder projected around the object. Please refer to FIG. 9. FIG. 9 is a diagram illustrating the second digital camera 22 capturing an image through the laser-framing viewfinder. The laser source 40 can be a low power laser generator and can generate laser beams at specific intervals of a time to conserve power used for the laser source 40 and protect the ~~user's~~ user's eyes from the laser. The laser source 40 of the present invention requires a proper arrangement of time, frequency, and intensity in order to optimize power savings and user safety. When shooting the image, the user presses the shutter button 32 to capture the image, and outputs the shot image data using the connecting port 34 to other peripherals, such as personal computers, notebooks, or printers for image editing or printing.

[0023] When an object is too far from the second digital camera 22 or no object exists for the laser beam to project a viewfinder box on, the laser-framing viewfinder cannot be used. In this situation, as shown in FIG. 8, it is allowable to slide the sliding set 38 ~~upwards~~ upwards in the housing 24 to move the second lens set 48 to the position between the two optical viewfinders 30, in order to view the object through the optical

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viewfinders 30. When viewing the object through the optical viewfinders 30, the user can switch off the laser source 40 by the control button set 33 to prevent visual interference with the laser beam. The control button set 33 can be a movable switch, which means that the sliding set 38 presses the control button set 33 when positioned inside the housing 24 to switch on the laser source 40. And when the sliding set 38 slides ~~upwards~~ in upwards in the housing 24 as shown in FIG. 8, the control button set 33 is released to switch off the laser source 40. In such a manner the laser source 40 can be switched on and off automatically.

[0024] The shutter of the ~~second~~ digital camera 22 can be two-staged. The focus can be automatically determined when the user presses the shutter button 32. Automatic exposure and white balance can be switched off in order to prevent the intensity of light from being effected by the laser beam. When the shutter button 32 is pressed at the first stage, the ~~second~~ digital camera 22 find the view and focus automatically, and when the shutter button 32 is pressed at the second stage, the image is captured through the camera lens 26, meanwhile the laser source 40 is switched off to prevent from interfering

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image shooting. If the shot is going to be aborted, the user can release the shutter button 32 at the first stage.

[0025] The present invention can be applied on other digital image capturing apparatuses, such as an image capturing apparatus on a notebook or a cellular phone. The application is not limited to digital cameras.

[0026] In contrast to the prior art, the present invention provides a laser-framing viewfinder of small size and low cost for image capturing apparatuses to replace conventional electrical viewfinders with high power consumption, high cost, and large size. In addition to these advantages, the laser-framing viewfinder can be used in the nighttime or under a condition of insufficient light that is not possible for conventional optical or electrical viewfinder to operate. And when the laser-framing viewfinder cannot be projected due to the object being too far from the second camera 22 or no object exists, users can slide the second lens set 48 to the position between the two optical viewfinders 30 in order to view the object through the optical viewfinders 30. Thus, the present invention includes optical and laser-framing viewfinders.



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[0027] Those skilled in the art will readily observe that numerous modifications and alterations of the device may be made while retaining the teachings of the invention. Accordingly, the above disclosure should be construed as limited only by the metes and bounds of the appended claims.